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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Call et al. Attorney Docket No: MESO0045

Serial No: 10/066,404 Group Art Unit: 2856

Filed: February 1, 2002 Examiner:

Title: ROBUST SYSTEM FOR SCREENING MAIL FOR BIOLOGICAL AGENTS

TRANSMITTAL LETTER FOR PETITION TO MAKE SPECIAL

Bellevue, Washington 98004

April 16, 2002

TO THE DIRECTOR OF THE PATENT AND TRADEMARK OFFICE:

Enclosed herewith is a Petition to Make Special related to the above-identified patent application. Also enclosed is an Information Disclosure Statement, Information Disclosure Statement Listing sheet, and eight references noted therein.

Our check No. 5851 in the amount of \$130.00 to cover the petition fee is enclosed. Please charge any additional fees or credit any overpayment to Deposit Account No. 01-1940. A copy of this sheet is enclosed.

Respectfully submitted,

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Ron Anderson

Ronald M. Anderson
Registration No. 28,829

I hereby certify that this correspondence is being deposited with the U.S. Postal Service in a sealed envelope as first class mail with postage thereon fully prepaid addressed to: Director of the Patent and Trademark Office, Arlington, VA 22202, on April 16, 2002.

Date: April 16, 2002

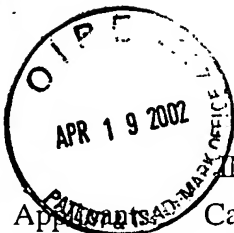
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Call et al.

Attorney Docket No: MESO0045

Serial No: 10/066,404

Group Art Unit: 2856

Filed: February 1, 2002

Examiner:

Title: ROBUST SYSTEM FOR SCREENING MAIL FOR BIOLOGICAL AGENTS

PETITION TO MAKE SPECIAL

Bellevue, Washington 98004

April 16, 2002

TO THE DIRECTOR OF THE PATENT AND TRADEMARK OFFICE:

In accord with requirements of 37 CFR §1.102, applicants hereby request an Advancement of Examination, based on applicants' invention being directed towards countering terrorism involving contamination of the mail with biological/chemical substances. The requisite petition fee of \$130 under 37 CFR 1.17(h) is enclosed. A statement explaining how the invention contributes to countering this form of terrorism, a summary of the most relevant art found by applicants, and an explanation of how the present invention distinguishes over that art, are provided below, and copies are included with the Information Disclosure Statement submitted concurrently herewith.

REMARKS

How the Invention Contributes to Countering Terrorism

Letters contaminated with weapons-grade *Bacillus anthracis* (anthrax) spores passed through the United States Postal Service (USPS) after September 11, 2001. Over 16 cases of documented infections and several deaths have been directly attributed to such letters. By November 2001, over 32,000 individuals in the United States were taking antibiotics prescribed by physicians specifically as a prophylactic measure to combat a potential exposure to anthrax contaminated mail. Multiple mail processing facilities and the equipment within those facilities were contaminated by exposure to what appears to have been a statistically small number of intentionally contaminated letters.

It should be noted that the USPS relies heavily on automation to process over 550 million pieces of mail every day. At the present time, there exists no mail processing equipment with the capability to screen mail for anthrax contamination, or other types of biological or chemical contaminants. Unfortunately, anthrax is not the only agent of concern. It has been suggested that the smallpox virus, which has been virtually eradicated in the natural environment, could be cultivated and used as an agent of terror in much the same fashion as the anthrax mailings were. Also, extremely toxic chemical agents, such as ricin, might be disseminated through the mail.

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1 To address the issue of biological agents in mail, it has been suggested that all items of mail
2 should be exposed to levels of radiation sufficient to kill such biological agents before the mail is
3 otherwise processed and distributed, thus eliminating the danger posed by such biological agents.
4 Unfortunately, recent experience within the U.S. Patent and Trademark Office has indicated that
5 irradiation of mail can lead to significant deterioration of the contents of such mail, nor can
6 irradiation detect the presence of biological agents, even should such agents be rendered harmless.
7 From a security and law enforcement perspective, it is highly desirable to detect an occurrence of
8 mail contamination, as such knowledge will greatly aid law enforcement agencies in any
9 investigation into the source of the contamination.

10 Furthermore, terrorists can employ the mail system to disseminate non-biological agents as
11 well. There are documented cases of explosives (e.g., letter bombs) being shipped through the mail.
12 During the United States military operations in Afghanistan in the fall of 2001, indications were
13 found that terrorists had obtained quantities of radioactive material, which could conceivably have
14 been employed to contaminate the USPS.

15 Applicants' invention seeks to identify mail within the postal system that is contaminated with
16 *anthrax* spores, or other biological, chemical, explosive, or radioactive agents. While analytical
17 devices and methods are available for detecting such agents, such equipment and methods are not
18 readily adapted for incorporation into high volume mail processing equipment. One embodiment of
19 the present invention is directed to a method and a sampling system for automatically screening
20 incoming mail to detect potential chemical and biological threats. While it is contemplated that the
21 present invention will be very useful for sampling mail, other types of packages, such as luggage, can
22 also be sampled using the principles of the present invention. Thus, the detailed description of the
23 mail sampling embodiment described in the present application should be considered to represent an
24 exemplary application of the present invention, but clearly is not the only application. Those of
25 ordinary skill in the art will appreciate that the elements of the present invention are also applicable to
26 the screening of a plurality of different types of closed packages, such as, but not limited to, mail,
27 luggage, shipping cartons, consumer goods, and the like.

28 The mail sampling embodiment of the present invention includes a plurality of subsystems,
29 including means for accessing particulates associated with a parcel (either from within the parcel, or
30 emanating from the parcel), means for aerosolizing any such particulates, a triggering sampler that
31 determines if a threat may exist in the sample based upon the relative number of particulates
32 contained in the sample or upon a quality of the particulates, and a detecting sampler that obtains a
33 sample that can be analyzed to identify a threat. Optional additional subsystems include an archiving
34 sampler that retains a solid sample of the particulates for archival purposes, one or more
35 identification units for processing a sample to determine if the particulates are a specific chemical or

1 biological agent, and a decontamination system for decontaminating a parcel identified as a potential
2 threat. Further preferred subsystems include a controller for automated control of the mail sampling
3 system, an alarm to notify personnel of potential threats, fluid flow virtual impactors for separating an
4 air sample into a major flow with few particulates of greater than a predetermined size and a minor
5 flow with significantly more particulates greater than the predetermined size, and rotating arm impact
6 collectors for removing particulates from a fluid flow. Preferably, the system is equipped with high
7 efficiency particle air (HEPA) filters on its outflow and operates under negative pressure to reduce a
8 risk of spreading contaminants beyond the system.

9 **Applicants' Search of the Prior Art**

10 Applicants conducted an on-line search of the patent databases of the U.S. Patent and
11 Trademark Office. Several different keyword searches were employed, as well as searches based on
12 U.S. Classes. The keyword searches included the terms "parcel screening," "luggage screening," and
13 "explosives detection." The classes searched included 73/41, 73/28.01, 73/28.04, 73/863.01,
14 73/863.11, 73/863.12, 73/863.21, 73/863.23, and 73/863.25. The most relevant references are
15 identified and discussed below.

16 U.S. Patent No. 3,997,297 (Jenkins et al.) (US1)

17 *Summary:* Discloses a method and apparatus for detecting the presence of a particular
18 constituent in a sampled atmosphere. The sample is drawn through two substantially identical flow
19 paths, each path containing a detector. The conditions prevailing in one of the flow paths is such as
20 to convert the particular constituent into matter, which will not produce a response in the associated
21 detector. When the particular constituent is vapor originating from an explosive, the conversion can
22 be by heating the flow path to a temperature at which the vapor breaks down into components that do
23 not produce a response in the associated detector. In the absence of the particular constituent in the
24 sampled atmosphere, the signals from the two detectors are substantially equal, but the presence of
25 the particular constituent results in a difference in signals from the two detectors.

26 *Relevance:* The Jenkins reference discloses the use of two different detectors for detecting the
27 presence of a target compound in air. This reference indicates that the detection of target compounds
28 in air is well understood. However, Jenkins does not teach or suggest a triggering sampler, as recited
29 in the claims defining applicants' invention.

30 U.S. Patent No. 4,111,049 (Lerner et al.) (US2)

31 *Summary:* Apparatus is described for securing vapor samples, particularly from articles such
32 as suitcases, travel bags, packages, and the like. The apparatus may include several depressor arms
33 hinged above a station along a conveyor belt or the like. A sampling probe for sampling vapor
34 expelled from the articles is positioned at the station. As the articles are carried by the conveyor past
35 the station, they lift the arms, which are suitably hinged above them so that the weight of the arms

1 causes a part of the vapor accumulated in the article to be expelled. The expelled vapor is sampled
2 by the probe at the station and may be carried to a suitable vapor analyzer for test.

3 *Relevance:* The Lerner patent discloses obtaining a particle sample from a closed container
4 by applying a force to the container, and then providing the particle sample that was obtained to a
5 detector. Lerner does not teach or suggest a triggering sampler.

6 U.S. Patent No. 4,580,440 (Reid et al.) (US3)

7 *Summary:* Reid discloses a method for detecting contraband substances in freight cargo
8 containers in which the container is agitated to disturb particulates therein, and air containing such
9 particulates is then sampled and the particulates are collected. The collected particulates include
10 naturally occurring particulates, which have absorbed vapors of the contraband substance during the
11 entire time that the container has been closed, and also include particulates of the contraband
12 substance itself. The collected particulates are heated to drive off vapors indicative of the contraband
13 substance, and the vapors are analyzed in a mass analyzer.

14 *Relevance:* The Reid patent discloses obtaining a particle sample from a closed container by
15 agitating the container, collecting an air sample with particulates, separating the particulates from the
16 air, and heating the particulates to generate a vapor, which is then analyzed. Reid does not teach or
17 suggest a triggering sampler.

18 U.S. Patent No. 4,820,920 (Bather) (US4)

19 *Summary:* This reference teaches a method for detecting a dangerous substance such as
20 explosives or drugs in an article in transit. The method comprises the steps of taking a sample of
21 atmosphere from the vicinity of the article, causing the sample to enter an ionization chamber of a
22 mass spectrometer, obtaining a mass spectrum of one or more constituents of the sample, comparing
23 the mass spectrum with one or more reference spectra, and generating a signal indicative of any
24 dangerous substance in the sample.

25 *Relevance:* The Bather patent discloses obtaining an air sample proximate a closed container.
26 An electromagnetic pulse can be applied to the object to cause contaminants associated with the
27 container to volatilize. The sample is then analyzed using mass spectrophotometry. Bather does not
28 teach or suggest a triggering sampler.

29 U.S. Patent No. 5,299,141 (Hungerford et al.) (US5)

30 *Summary:* Hungerford discloses fluid sampling apparatus provided as a unitary structure that
31 automatically collects fluid samples according to modes of operation selected by a user, while
32 monitoring an analyte of interest on a real-time basis. The apparatus responds to signals from a fiber
33 optic sensor, and collects and stores sampling and analyte data for later retrieval. The user may select
34 from various modes of operation, including sampling triggered by a predetermined value(s) of the
35 analyte, flow proportional sampling, and/or sampling at predetermined time intervals. The apparatus

1 includes a self-contained microprocessor, together with associated program and data memory, for
2 automatically controlling sampling operations, calculating analyte values on the basis of signals from
3 the fiber optic sensor, calculating flow rate on the basis of signals from a flow sensing arrangement,
4 and storing data relating to sample collection, analyte levels, and flow rate. The apparatus is further
5 adapted to measure and store the actual discharge volume of the analyte loaded into a receiving fluid
6 body, with the program memory being programmed to calculate loading values on the basis of flow
7 rate values and analyte values as detected from any type of sensor capable of in situ real-time analyte
8 measurement. Stored data can be called up on a display of the apparatus, or transferred to an external
9 output device via a modem and telecommunication network or a portable data transfer unit.

10 *Relevance:* The Hungerford reference discloses using a triggering sampler to continually
11 monitor a flow of fluid, and based on the triggering sampler determining that a predefined value has
12 been exceeded, the system obtains a fluid sample for subsequent analysis. The fluid sample system is
13 very simple in that it only need be capable of diverting a flow of fluid into a receiver. While
14 Hungerford teaches a triggering sampler, Hungerford is employed to collect liquid samples, such as
15 from a sewer or discharge pipe, not to collect particulates from mail, and not by sampling air.

16 U.S. Patent No. 5,585,575 (Corrigan et al.) (US6)

17 *Summary:* This reference discloses an explosive detection screening system used for the
18 detection of explosives and other controlled substances such as drugs or narcotics. The screening
19 system detects the vapor and/or particulate emissions from the aforementioned substances and reports
20 that they are present on an individual or object and the concentration of each substance detected. The
21 screening system comprises a sampling chamber for the collection of the vapor and/or particulate
22 emissions, a concentration and analyzing system for the purification of the collected vapor and/or
23 particulate emissions and subsequent detailed chemical analysis of the emissions, and a control and
24 data processing system for the control of the overall system.

25 *Relevance:* The Corrigan reference discloses obtaining a sample from a person or object, then
26 providing that sample to two different sampling systems, including a first sampling system that
27 vaporizes particulates and analyzes vapors, and a second that concentrates the sample before analysis.
28 Corrigan does not teach or suggest a triggering sampler.

29 U.S. Patent No. 5,760,314 (Bromberg et al.) (US7)

30 *Summary:* A sampling apparatus is disclosed for collecting a sample of air from a subject
31 such as a person. The apparatus includes a bypass that divides the sample air stream into a bypass
32 portion and a collector portion. The collector portion of the air stream is delivered to a collector
33 which traps entrained particles. After the sampling cycle is completed, a mechanical conveyor
34 removes the collector from fluid communication with the bypass and transports it to an analyzing
35 unit. A chamber in the unit receives the collector, and a diverter couples the chamber with either of

1 two vapor and/or particle analyzers. During analysis, a heater in the unit heats both the chamber and
2 the diverter. A sample collected from one subject can be analyzed in one of the analyzers while
3 another sample is being collected from another subject. The other analyzer can then be used to
4 analyze the second sample.

5 *Relevance:* The Bromberg patent discloses collecting an air sample adjacent an object or
6 person, separating any particles from the air sample, heating the particles, and then analyzing the
7 collected particles using paired analyzers. Bromberg does not teach or suggest a triggering sampler.

8 U.S. Patent No. 6,324,927 (Oranth et al.) (US8)

9 *Summary:* Oranth teaches a cargo sampling system that encloses a cargo container in a sealed
10 chamber. The cargo container is agitated so that particulates and vapors are released from the cargo
11 container. Blasts of air are directed at the cargo container to further dislodge particulates. The
12 chamber undergoes successive cycles of pressurization and depressurization. Collected particulates
13 and vapors are analyzed in real-time using conventional analytical tools to detect contaminants such
14 as explosives, drugs, and biological agents.

15 *Relevance:* The Linker reference discloses placing a container in a containment area, air jets
16 and agitation to dislodge particles and vapors, which are then collected and analyzed. Oranth does
17 not teach or suggest a triggering sampler.

18 U.S. Patent No. 6,334,365 (Linker et al.) (US9)

19 *Summary:* Linker teaches a portal apparatus for screening persons or objects for the presence
20 of trace amounts of target substances such as explosives, narcotics, radioactive materials, and certain
21 chemical materials. The portal apparatus can have a one-sided exhaust for an exhaust stream, an
22 interior wall configuration with a concave-shape across a horizontal cross-section for each of two
23 facing sides to result in improved airflow and reduced washout relative to a configuration with
24 substantially flat parallel sides, air curtains to reduce washout, ionizing sprays to collect particles
25 bound by static forces, as well as gas jet nozzles to dislodge particles bound by adhesion to the
26 screened person or object. The portal apparatus can be included in a detection system with a
27 pre-concentrator and a detector.

28 *Relevance:* The Linker reference discloses placing a container (or person) in a containment
29 area, air jets to dislodge particles, which are collected, pre-concentrating particle laden air, and then
30 separately collecting and analyzing the particles and any vapors. Linker does not teach or suggest a
31 triggering sampler.

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1 Novelty of Applicants' Invention in View of the Identified Prior Art

2 Applicants' broadest independent claim, Claim 1, is reproduced below:

3 1. A system for detecting hazardous particles associated with
4 a parcel, comprising:

5 (a) a housing into which a parcel to be analyzed can be placed,
6 so that a parcel can be isolated from an environment outside the housing;

7 (b) a triggering sampler in fluid communication with a volume
8 of air within said housing, said triggering sampler capable of detecting
9 particles associated with a parcel that are entrained within the volume of
10 air in said housing, said triggering sampler generating a detection signal in
11 response to the detection of such particles; and

12 (c) a detecting sampler in fluid communication with said
13 volume of air and electrically coupled to respond to the detection signal
14 from said triggering sampler, said detecting sampler, in response to said
15 detection signal, removing particles entrained within said volume of air,
16 thereby obtaining a sample of particles, to enable an analysis to determine
17 if particles associated with a parcel that are collected by the detecting
18 sampler are hazardous.

19 While the art discussed above is indicative of many different systems for collecting particles
20 for analysis, none of this art discloses the use of a triggering sampler in conjunction with collecting
21 particles from a parcel. Several of the references disclose the use of multiple detectors that are
22 employed to analyze particles collected from an object (or vapors from a particle that is collected and
23 then heated). In particular, Linker, Corrigan and Bromberg disclose the use of paired detectors.
24 However, none of these references suggests employing one detector as a trigger that controls the
25 operation of a second detector. Also, none of the references relating to collecting and analyzing
26 particles teach or suggest using one detector as a trigger to determine when a sample of particle
27 should be collected for further analysis. Applicants note that the art relating to the detection of
28 particle contaminants in luggage, or on persons, is quite crowded. Much of the art employs x-ray
29 based detection, as opposed to the collection of particles, and is thus not relevant to the claims in the
30 present application and is not represented above.

31 The only reference found that discloses the use of any form of triggering detector is
32 Hungerford, which applies the concept of a triggering detector to a significantly different sampling
33 problem. While Hungerford's device includes a triggering sampler and a detecting sampler, the
34 samplers disclosed in Hungerford are not equivalent to those recited in applicants' claims. With
35 respect to the triggering sampler described by Hungerford, the reference describes the triggering

1 sampler as monitoring at least one predetermined value of a specific substance being monitored.
2 Hungerford describes the triggering sampler as a sensor that senses changes in a clad portion (33A),
3 which is particularly responsive to a chemical or analyte; the refractive index of the clad
4 portion (33A) changes so that the amount and angles of light internally reflected from the core-clad
5 interface (34) also changes. The resulting change in light transmission along core (32) in turn results
6 in a change in the intensity and/or angle of light signals detected by a photodetector (36), and
7 the change may be correlated to a known relationship between the analyte of interest and the
8 clad portion. Hungerford discloses another embodiment of the triggering sampler as a reservoir
9 type fiber optic sensor in which the sensing element comprises a reagent that interacts with an analyte
10 of interest. The reagent is disposed at the tip of the optical fiber, as part of a sensor package
11 containing a plurality of fiber optic sensors, each responsive to a different analyte of interest. A level
12 of total suspended solids is one criterion that the triggering sampler can monitor. It should be noted
13 that total suspended solids is a term used only in describing a characteristic of a liquid, but not a gas
14 (or air).

15 Clearly, Hungerford's triggering sampler is not usable for detecting particulates in an air
16 stream, but rather is intended for detecting a specific analyte or chemical in a liquid stream, or
17 detecting total suspended solids in a liquid. Further, Hungerford specifically describes obtaining a
18 liquid sample for the detecting sampler once the triggering samples provide a signal. Applicants
19 positively recite removing particles entrained within a volume of air, thereby obtaining a sample of
20 *particles*. Thus, the detecting sampler disclosed by Hungerford is not equivalent to applicants'
21 detecting sampler, because the detecting sampler of Hungerford employs bottles that are filled with
22 liquid, and such a sampler is not capable of removing and responding to particles in an airflow. As
23 should be apparent from applicants' specifications, particles are generally separated from an airflow
24 using an impact collector, several types of which are described in great detail therein. Logically a
25 sampler that collects and stores a volume of liquid for later analysis simply comprises a container
26 capable of storing a volume of liquid, whereas a sampler that removes particles from air to provide a
27 sample of such particles must be something more than a container capable of storing a volume of
28 liquid. Clearly, Hungerford's detecting sampler is not equivalent to applicants' detecting sampler, as
29 recited in Claim 1.

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1 To achieve an equivalent invention, the device of Hungerford would need to be modified to
2 include a containment housing into which an air stream could be isolated, and the triggering and
3 detecting samplers would need to be changed to be responsive to, or to collect, particles entrained in
4 an air stream. It appears that such changes would make the device unsuitable for its intended
5 purpose. Note that Hungerford clearly describes a device for use in streams, waterways, or sewers.
6 Should Hungerford be modified to include a detecting sampler that removes particles from air to
7 provide a sample of such particles, the resulting device would no longer provide a sample of a liquid,
8 as it would have been modified to provide a sample of particles. Thus, the required modification
9 would result in a device *unsatisfactory for its intended purpose* (see MPEP 2143.01), because the
10 purpose of Hungerford's device was to obtain a sample of a liquid, not a sample of particles. Thus,
11 such a modification does not provide a basis for a *prima facie* case of obviousness.

12 With respect to the art discussed above that discloses collecting particles from a closed
13 container, none of those references disclose or suggest the use of a triggering sampler. There does
14 not appear to be any basis for concluding that it would have been obvious to modify any of those
15 references to include a particle detecting triggering sampler. In each reference, the art clearly
16 describes devices in which samples are continually collected and processed, in real-time, by at least
17 one integrated analytical device. Particularly in the art disclosing detecting hazardous agents
18 associated with luggage or other containers, there does not appear to be any recognition that any
19 benefit would accrue by including a triggering sampler as described by applicant. In Hungerford's
20 device, the liquid sample is collected for offsite analysis. Thus, Hungerford only collects a liquid
21 sample when a triggering sampler indicates a need for a liquid sample, thereby reducing the number
22 of sample containers the system needs to provide for operation over an extended time. The art related
23 to detecting hazardous agents associated with luggage or other containers all include onboard means
24 for analysis, so reducing the volume required for containers to store samples provides no motivation,
25 as *no samples are stored*, (each sample being analyzed immediately).

26 Because none of the art discussed above describes an equivalent invention to that defined by
27 applicants' claims, and because there appears to be no reasonable basis for modifying any of the
28 above noted references to achieve the recited invention, it appears that the present invention recites
29 patentable subject matter in view of this art. Applicants' dependent claims recite additional elements
30 that further distinguish over the cited art, such as the use of virtual impactors, radial arm collectors,
31 and an archival sampler.

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1 Conclusion

2 Having fulfilled the requirements for a Petition to Make Special, applicants request that
3 prosecution of the present application be expedited forthwith. Should any questions arise during
4 prosecution, the Examiner is asked to telephone applicants' attorney at the number listed below, to
5 further expedite the prosecution of the instant application.

6
7 Respectfully submitted,

8 *Ron Anderson*
9

10 Ronald M. Anderson
11 Registration No. 28,829
12

13 I hereby certify that this correspondence is being deposited with the U.S. Postal Service in a sealed envelope as
14 first class mail with postage thereon fully prepaid addressed to: Director of the Patent and Trademark Office, Arlington,
VA 22202, on April 16, 2002.

15 Date: April 16, 2002
16 RMA/MCK:ssa

Kathy Pami

17 Enclosures

18 Information Disclosure Statement
19 Information Disclosure Statement Listing
20 9 References
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